

SOME FACTORS INFLUENCING OYSTER MUSHROOM (*Pleurotus ostreatus*) DEVELOPMENT ON RICE STRAW

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ABSTRACT

Some factors influencing Oyster fungus, *Pleurotus ostreatus* (Jacq. Ex. fr) Kummer, development on rice straw were investigated. Generally grinding method yielded better results concerning Oyster yield, biological efficiency and substrate dry matter loss than chopping method. *P. ostreatus* mushroom also grew faster on the ground straw, than on the chopped straw, with their growth cycles being shorter than on the chopped straw. No significant difference was found between the two sizes, 2.5 and 5.0 cm, of the chopped straw. Further reduction of the particle size by grinding the straw to 0.5 cm, however, resulted in lower mushroom yield. With the tested spawn levels, 6% and 9% levels (on the basis of dry weight of organic matter) resulted in significantly lower mushroom yield than the other levels. Spawn level 12% (on the basis of dry weight of organic matter) enhanced mushroom yields. Inoculation with *Pseudomonas fluorescence* had beneficial impact for mushroom production and biological efficiency. *P. fluorescence* inoculum appreciably reduced total number of days for cultivation of about 2 days compared with uninoculated treatments. The crude protein content reached 6.14 g/100 g dry matter basis of spent rice straw. The fungal cultivation reduced ($p<0.05$) the cellulose content of the rice straw. Hemicellulose content in spent rice straw showed a similar trend. Organic matter content decreased from 80.15 to 64.20 g / 100 g dry matter basis.

Keywords: Degradation, *Pleurotus ostreatus* mushroom, lignocellulosic wastes, yield, rice straw, *Pseudomonas fluorescence*.

INTRODUCTION

Cultivation of *P. ostreatus* on agricultural residues, such as rice straw, is a value-added process to convert this substance, which is otherwise considered to be waste, into human food. Cultivation is one of most efficient biological ways by which this waste can be recycled (Madan *et al.*, 1987, Zhang *et al.*, 2002 and El-Sawah *et al.*, 2008).

There have been various reports on other factors, than substrate used for mushroom production, that influence the development of Oyster mushrooms (Gregori *et al.*, 2007). None of these factors has been studied in depth. Straw size reduction method and particle size had effect on mushroom production (Zhang *et al.*, 2002). Spawn inoculation level also effect the economics of the productivity process (Zhang *et al.*, 2002). Inoculation of pure *P. ostreatus* mycelium cultures with strains of fluorescent *Pseudomonas* spp., isolated from the mycelial plane of commercially produced mushrooms, promoted the formation of primordia and enhanced the development of the basidiomata. Thus, inoculation of the mycelium with specific bacteria may have beneficial applications for mushroom production (Cho *et al.*, 2003).

Irradiation by red and green light stimulated vegetative growth of *P. ostreatus* mycelium and shortened the substrate colonization and fructification time. The increased fruiting body yield in irradiated cultures